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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/002,483

11/01/2001

Jeffrey W. Carr

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EXAMINER

OLSEN, ALLAN W

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/18/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/002,483

Applicant(s)

CARR, JEFFREY W.

Examiner

Allan Olsen

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-12,14-29 and 34 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 34 is/are allowed.
6) ☒ Claim(s) 1-6,8-12,14-29 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 01 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/17/2008.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6, 8-12, 14, 18-22, 24, 28 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4,035,604 issued to Meleka et al. (hereinafter, Meleka).

Meleka teaches a method for shaping a surface via the removal of burrs. Meleka teaches the pressure can be from 0.1 atm to several atm (column 4, lines 1-7). As Meleka teaches using pressures both above and below atmospheric pressure, Meleka necessarily teaches the process takes place within a processing chamber. Meleka teaches using an inductively-coupled plasma (ICP) torch that has an outer tube to communicate a plasma gas to a distal end of the plasma torch and an inner tube nested within the outer tube to communicate a reactive precursor to the distal end (see figures 1-3). Meleka teaches moving the workpiece relative to the torch (column 9). Meleka teaches a plasma sheath is formed between the distal end of the torch and the plasma discharge (see figures 2-3). Meleka teaches using an argon gas as the plasma gas (column 4, line 59). Meleka teaches introducing O₂ into the central tube and thereby teaches providing the reactive precursor to the plasma discharge through the inner tube to generate a reactive species in the plasma torch (see, for example, figure 1 and column 5, line 11). Meleka teaches controlling the plasma flame by controlling the

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power (column 5, line 67-68). Meleka teaches controlling the degree of ionization (column 6, lines 37) and choosing plasma parameters so that the plasma becomes concentrated at the burrs (abstract) and therefore Meleka teaches controlling a distribution of reactive species within the plasma discharge and directing the plasma discharge/reactive species to a target portion of the surface of the workpiece.

Meleka teaches that the step of shaping the surface of the workpiece comprises removing material from the surface of the workpiece (column 2, line 64-column 3, line and column 6, lines 4-62).

Meleka teaches rotating the workpiece with respect to the plasma torch (column 9, line 16).

Meleka teaches providing up to 7000 ml/min O₂ and thereby teaches controlling the mass flow of the reactive precursor into the plasma torch (column 5, lines 9-10).

Meleka teaches selecting a concentration of between 30 and 50% of the reactive precursor, O₂, to be introduced into the plasma discharge.

Meleka teaches using a plasma torch with an inductive coil wrapped around the outer tube of the plasma torch hence Meleka teaches coupling the RF energy to the plasma discharge in an annular region of the plasma torch.

Meleka teaches the plasma torch includes an intermediate tube arranged between the outer tube and the inner tube and introducing an auxiliary gas into the intermediate tube (see figures 2 and 3).

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Meleka teaches using the central tube is the shortest of the three tubes and therefore is recessed within the intermediate/auxiliary gas tube. This configuration would keep the plasma discharge away from the inner tube (see column 7, lines 4-18).

Meleka teaches controlling the plasma gas flow rates to adjust the jet momentum which would adjust the position of the plasma discharge relative to the distal end (column 3).

Meleka teaches selecting the inner diameter of an outer tube of the plasma torch and Meleka teaches that this controls the size of the plasma discharge (column 7, lines 41-65).

Meleka teaches communicating the plasma gas to the outer tube tangentially (see figure 2).

Meleka teaches maintaining the temperature of the plasma torch between 5,000 and 15,000 degrees C (column 7, line 29).

In the process of Meleka, the surface of the workpiece would inherently be cleaned with the plasma torch.

Meleka teaches the sharp pointed burrs are removed hence Meleka process can be viewed as polishing the surface of the workpiece with the plasma torch.

Meleka teaches that the rate of material removal is affected by the introduction of a reactive gas such as O₂, chlorine or nitrogen and producing a volatile reaction product on the surface of the workpiece (column 6, lines 13-62).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meleka.

The teaching of Meleka as applied above is herein relied upon.

Meleka does not teach planarizing the surface of the workpiece with the plasma torch. Also, Meleka does not teach using a plasma torch with a multiple head to increase an etch rate of the plasma torch. Meleka does not teach that the step of shaping the surface of the workpiece comprises causing minimal or no damage to the workpiece underneath the surface.

It would have been obvious to one skilled in the art to use a torch with multiple heads simply to increase the efficiency of the process.

As Meleka's process is generically applicable to metallic workpieces, it would have been obvious to one skilled in the art to apply Meleka's burr removal process to a workpiece that, except for the presence of burrs, was planar, and in so doing the skilled artisan would planarize the surface of the workpiece.

It would have been obvious to one skilled in the art to operate Meleka's process in a manner that caused minimal or no damage to the workpiece underneath the surface because it is obvious that the skilled artisan would not wish to damage the

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workpiece and Meleka explicitly addresses the desire to prevent damage to the workpiece from arcing (for example, column 2, lines 25-31).

Response to Arguments

Applicant's arguments filed August 8, 2008 have been fully considered and were found to be persuasive in that Böhm does not teach an ICP with a coil at the end of the torch and in Fleming there is no chemical reaction.

Allowable Subject Matter

Claim 34 is allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M, W and F: 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Allan Olsen/
Primary Examiner, Art Unit 1792